

## 新概念 VLSI システム研究室 1

### 1) 当該研究室の研究成果について

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

不揮発性素子に基づくマイクロコントローラとその FPGA アクセラレータに関する成果が 2 編の ISSCC に採択されていることが特に評価できる。これらは、この分野の最高レベルの国際会議であり、これに採択されることは、その成果の重要性が世界的に認められた証拠である。また、CIES テクノロジーフォーラムでの関連セッション開催や招待講演の依頼が数多くあるようで、日本の産業界からの注目度も高い。

### 2) 当該研究室構成員の学会活動について

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

羽生教授は IEEE TC の委員長、多値技術に関する国際会議のシンポジウム委員長を務め、また多くの国際会議・研究会の委員を務めている。また、夏井准教授と鬼沢助教も多くの国際会議・研究会の幹事補佐、委員を務めるなど、研究室構成員の学会への貢献度は非常に大きい。

### 3) 当該研究室構成員の社会貢献について

( ) Excellent (\*) Very Good ( ) Good ( ) Fair ( ) Poor

高専、高校での出前講義、社会人への講座、サマースクール、通研公開等における指導・啓蒙活動は、特に評価できる。

### 4) 当該研究室の競争的資金の獲得状況について

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

科研費においては、羽生教授が代表の基盤研究 (S) が特に評価できるほか、分担分も含め各構成員がそれぞれ企業や財団等から多額の競争的資金を獲得している。

### 5) 国際共同研究・連携研究・連携教育活動の実績について

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

トロント大学、McGill 大学との共同研究・連携が強く、教員や学生の招聘・派遣等多くの実績を重ねている。また、共著の論文も多く、それらの連携の成果も多く現れている。

### 6) 共同利用・共同研究拠点活動の実績について

( ) Excellent (\*) Very Good ( ) Good ( ) Fair ( ) Poor

各構成員が積極的に通研共同プロジェクトに参画している。

### 7) その他、総合的なコメント

特許出願数、招待講演数、受賞等の多さは、羽生研究室の研究レベルの高さを物語っている。また、数多くの博士課程・修士課程の学生を指導し、優れた人材を世に送り出していることも大きな貢献である。

総合的には、羽生研究室は、一貫して不揮発性ロジック、機能デバイス、多値・非同期式制

御に関する研究において大きな成果を残してきており、最近ではそれを脳型 LSI という形で社会の要求にマッチさせた形で貢献しているところが特に評価できる。

## 新概念 VLSI システム研究室 2

1. How would you evaluate the research activities in this period?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

Excellent research output and impact of research contributions.

2. How would you evaluate the activities of the members in the laboratory for the academic societies?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

The laboratory members participated in leadership positions top international academic societies.

3. How would you evaluate the contribution of the laboratory to society?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

Research firsts, such as first fabricated nonvolatile logic-in-memory chip using automated design flow. Extensive activities for national, local governments, and public organizations.

4. How would you evaluate the lab's level of funding?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

Excellent record in obtaining research funds.

5. How would you evaluate the lab's collaborative research, including international joint research and collaborative education?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

Extensive international cooperation and collaborative research.

6. RIEC is one of Japan's "Joint usage/Research Center" or "Nation-wide Cooperative Research Projects" institutes. How would you evaluate the achievements of work done under this framework?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

7. Additional or overall comments

World-class laboratory doing important and impactful work.

## 新概念 VLSI システム研究室 3

1. How would you evaluate the research activities in this period?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

Over the past six years, RIEC has been demonstrated the ability to produce a steady stream of high quality publications on the international stage. In particular, their 2014 ISSCC work on reducing the standby power of high performance MCU's using FeRAMs has firmly established RIEC as the power house research institute. An extended article in the 2016 IEEE Proceedings on the same topic further allowed RIEC's work to be exposed to a wild range of audience.

2. How would you evaluate the activities of the members in the laboratory for the academic societies?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

The RIEC team has been involved in many other voluntary services for the technical society, including the chairing and organizing of various conferences. More notably Prof. Hanyu serving as the general chair for the 2016 IEEE International Symposium on Multiple-Valued Logic, and Prof. Hanyu's role as the chair for IEEE Computer Society Technical Committee of Multiple-Valued Logic (TC-MVL) in 2014 and 2015.

3. How would you evaluate the contribution of the laboratory to society?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

Evidence of contribution to society cannot be better said than the 2015 Ministry of Education, Culture, Sports, Science and Technology Award for research on nonvolatile logic in-memory integrated circuits. This award was for RIEC's long term promotion of non-volatile logic.

4. How would you evaluate the lab's level of funding?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

The level of research funding that the RIEC team has been able to secure in the past 6 years is exceptional. In particular securing the level of support from the Grant-in-Aid for Scientific Research (A and B) are instrumental in carrying the excellent research activities.

5. How would you evaluate the lab's collaborative research, including international joint research and collaborative education?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

The RIEC team has participated frequently in various international technical and academic forums. In particular this group has presented invited papers in various high profile conferences and journals, These included IEDM 2014, ISSCC 2015, and DATE 2015. These alone are testimony on their members' recognitions, collaborations and activities in academia.

6. RIEC is one of Japan's "Joint usage/Research Center" or "Nation-wide Cooperative Research Projects" institutes. How would you evaluate the achievements of work done under this framework?

(\*) Excellent ( ) Very Good ( ) Good ( ) Fair ( ) Poor

RIEC's work on non-volatile logic and brainware VLSI are indispensable pillars of technology in

promoting the Nation-wide Cooperative Research Projects. This research direction is critical for the development of high performance and ubiquitous computing.

7. Additional or overall comments

I believe that RIEC has demonstrated excellent achievement in the last size years. Their accomplishment is excellent and cost-effective.